

WE CLAIM:

1. A steering assembly for a bicycle comprising; a front wheel fork having an integral upwardly extending steerer tube, headset bearings coaxial with said steerer tube, a handlebar assembly including a stem having a vertical member and slideably mounted inside said steerer tube, the vertical member of said stem has a section with a non-round cross sectional shape, said steerer tube being fitted with a restraining device to permit axial movement between said stem and said steerer tube, wherein said stem is manually adjustable in height in one position of said restraining device and the steerer tube is fixed onto said stem when said restraining device is in a second position.
2. A steering assembly of claim 1 wherein an upper end of said steerer tube extends above said headset bearings.
3. A steering assembly of claim 2 wherein said upper end of said steerer tube is slotted to allow clamping onto said stem.
4. A steering assembly of claim 1 wherein said steerer tube has a section of non-round cross sectional inner surface shape which matches a section of cross sectional shape of said stem and does not allow for axial rotation of said stem relative to said steerer tube when said non-round surfaces are engaged.
5. A steering assembly of claim 1 wherein said restraining device has a section of non-round cross sectional inner surface shape which matches a section of non-round cross sectional shape of said stem and does not allow for axial rotation of said stem relative to said steerer tube when said non-round surfaces are engaged.
6. A steering assembly of claim 1 wherein said stem has one or more longitudinal channels and, at least one internal protrusion integral to the steerer tube fits into at least one of said longitudinal channels in the stem and does not allow the stem to rotate about the steering axis.
7. A steering assembly of claim 1 wherein said stem can rotate axially about the steering axis to a position substantially parallel with the front wheel of the bicycle.
8. A steering assembly of claim 7 wherein, after said restraining device is manually unlocked, a second operation is performed to allow said stem to be rotated axially about the steering axis.

9. A steering assembly of claim 7 wherein, unlocking said restraining device is the only action required to allow said stem to be both adjusted vertically and to be rotated axially about the steering axis.
10. A steering assembly of claim 7 wherein, a second restraining device must be unlocked in order to allow said stem to be rotated axially about the steering axis.
11. A steering assembly of Claim 8 wherein said second operation consists of moving the handlebar to a specific height.
12. A steering assembly of claim 1 wherein said stem has a section with a non-round cross sectional shape which is octagonal.
13. A steering assembly of claim 6 wherein said stem has a horizontal channel which, when said protrusion enters said horizontal channel, allows for rotation of the stem about the steering axis.
14. A steering assembly of Claim 6 wherein said protrusion is fixed in height.
15. A steering assembly of Claim 6 wherein said protrusion is spring loaded against said stem and rests in said longitudinal channel and is retractable in height.
16. A steering assembly of Claim 15 wherein the bottom of said longitudinal channel does not allow said protrusion to slide and said protrusion must be manually held disengaged from the bottom of said longitudinal channel in order to allow for movement of said stem.
17. A steering assembly of claim 6 wherein said stem has a second longitudinal channel wherein said protrusion resides in the first longitudinal channel during riding and in the second longitudinal channel after said stem is rotated for storage.
18. A steering assembly of claim 6 wherein said stem has a hole and wherein said protrusion resides in said longitudinal channel during riding and in the hole after said stem is rotated for storage.
19. A steering assembly of claim 1 wherein the cross sectional shape of the vertical member of said stem has a non-round portion and co-axial a round portion.
20. A steering assembly of Claim 7 further comprising a automatic lock, wherein said stem cannot rotate to the riding position without said automatic lock engaging which, once engaged, does not allow said stem to rotate.

21. A steering assembly of Claim 7 further comprising a manually operated fastening device and wherein said stem cannot rotate to the riding position without said manually operated fastening device being engaged which, once engaged, does not allow said stem to rotate.
22. A steering assembly of Claim 13 wherein said horizontal channel has a bottom surface equipped with ramps which allow said protrusion to move freely in one direction, but not in an opposite direction unless said protrusion is at least partially retracted.
23. A steering assembly of Claim 13 wherein said horizontal channel is configured to allow said stem to rotate such that the handlebar can end up approximately parallel to the front wheel of the bicycle and on either the right side, or the left side, of the bicycle.
24. A steering assembly of Claim 15 wherein said protrusion is configured such that it must be retracted completely out of said longitudinal channel in order to allow for rotation of said stem.
25. A steering assembly of Claim 6 further comprising a cross channel in said stem, said cross channel set at an angle to said longitudinal channel and which, when said protrusion enters said cross channel, allows for rotation of the stem about the steering axis accompanied by vertical movement.
26. A steering assembly of Claim 7 further comprising means associated with said handlebar such that when is rotated to a position approximately parallel to the front wheel, said handlebar can be engaged to the front wheel and used to steer the bicycle for parking or during walking.
27. A steering assembly of Claim 7 wherein said handlebar is constrained in its rotation to end at a position approximately parallel to the front wheel.
28. A steering assembly of Claim 1 wherein said stem comprises a horizontal member and a vertical member, said horizontal member rotatable about said vertical member.
29. A steering assembly of Claim 1 further comprising a tether connected to said steerer tube wherein said stem is blocked from being pulled above a specific height or removed from said steerer tube by said tether.
30. A steering assembly of Claim 1 wherein the vertical member of said stem has a larger diameter lower section which blocks said stem from being pulled above a specific height or being removed from said steerer tube.

31. A steering assembly of Claim 1 wherein a portion of the outer surface of said steerer tube has a non-round cross sectional shape.
32. A steering assembly of Claim 1 wherein a portion of the outer surface of said steerer tube is threaded.
33. A steering assembly of Claim 1 further comprising a tool operated in a rotatable manner for steering assembly alignment purposes wherein said steerer tube is mechanically attached to the crown of said front wheel fork by said tool.
34. A steering assembly of Claim 11 wherein said stem has the same cross sectional shape before and after rotation for storage.
35. A steering assembly of Claim 1 wherein said stem has a different cross sectional shape before and after rotation for storage.
36. A steering assembly of Claim 1 wherein said steerer tube has a longitudinal channel cut on its inner surface.
37. A steering assembly of Claim 1 wherein said steerer tube has a longitudinal protrusion on its inner surface.
38. A steering assembly of Claim 1 wherein said steerer tube has a portion of its inner surface threaded.
39. A steering assembly of Claim 1 further comprising a collar fitted on said steerer tube and with a corresponding shape wherein the upper end of said steerer tube has a shape that discourages rotation of said collar.
40. A steering assembly of Claim 1 wherein said restraining device comprises one or more collars fastened to the outside of said steerer tube.
41. A steering assembly of Claim 3 wherein said restraining device is a clamping collar which clamps onto said steerer tube which, in turn, clamps onto said stem.
42. A steering assembly of Claim 40 wherein said restraining device comprises two fastening portions where a first portion fastens onto said steerer tube and a second portion fastens onto said stem.

43. A steering assembly of Claim 42 wherein said restraining device comprises a dimensionally stable collar which uses one or more pressure cylinders inserted through holes to fasten to said steerer tube and said stem.

44. A steering assembly of Claim 40 wherein said restraining device comprises a dimensionally stable collar which uses one or more pressure cylinders inserted through holes in said collar to fasten to said steerer tube and one or more pressure cylinders inserted through holes in said collar and said steerer tube to fasten to said stem.

45. A steering assembly of Claim 40 wherein said restraining device comprises a collar encircling the outside of the upper end of the steerer tube as well as the inside of the upper end of the steerer tube.

46. A steering assembly of Claim 42 wherein said restraining device comprises one or more slotted sections for clamping and have one or more hinges which allow for wider movement in the slot width.

47. A steering assembly of Claim 40 wherein said restraining device comprises a collar mounted to said steerer tube, said collar providing an upper surface for applying downward axial pressure for adjustment of headset bearings.

48. A steering assembly of Claim 47 further comprising a second lower collar located below said first upper collar wherein, said lower collar has a ramped upper surface and said upper collar has a ramped lower surface, whereby when the two collars are placed adjacent to each other, said upper collar is fastened in place and then said lower collar is turned relative to said upper collar causing said lower collar to move downward and away from said upper collar thereby applying pressure to the headset bearings.

49. A steering assembly of Claim 40 wherein said restraining device is a two piece collar comprised of an upper collar member and a lower collar member, wherein said upper collar member has a cross sectional inner surface shape that matches the cross sectional outer surface shape of said stem and said lower collar member has a inner cross sectional shape which matches the outer surface shape of said steerer tube, wherein said upper collar member and said lower collar members are rotatably connected to each other and whereby, the raising and

lowering of said stem is controlled by said upper collar member and, if rotation is required, said upper collar member rotates with said stem member while said lower collar member remains fixed to said steerer tube.

50. A steering assembly of Claim 40 wherein, at least a portion of said collar is threaded on its inner surface for threading onto a threaded steerer tube.

51. A steering assembly of Claim 40 further comprising a bolt to fasten said restraining device to said steerer tube as well as align said restraining device for a correct riding position.

52. A steering assembly of Claim 1 further comprising a secondary safety lock having a protruding, spring loaded button which resides inside said stem and, when locked, protrudes through a hole in said stem and said steerer tube.

53. A steering assembly of Claim 1 further comprising a secondary safety lock having a protruding, spring loaded button which resides outside said steerer tube and, when locked, protrudes through a hole in said steerer tube into a hole in said stem.

54. A method for rotating the steering assembly of a bicycle having a front wheel fork with an integral upwardly extending steerer tube, headset bearings coaxial with said steerer tube, a handlebar assembly including a stem having a vertical member and slideably mounted inside said steerer tube, the vertical member of said stem has a section with a non-round cross sectional shape, said steerer tube being fitted with a restraining device to permit axial movement between said stem and said steerer tube, wherein said stem is manually adjustable in height in one position of said restraining device and the steerer tube is fixed onto said stem when said restraining device is in a second position, said method comprising the steps of: unlocking said restraining device and then performing a second action which then allows said steering assembly to be rotated about the steering axis to be approximately parallel with the front wheel of the bicycle.

55. A steering assembly for a bicycle comprising; a front wheel fork having an integral upwardly extending steerer tube, a handlebar assembly including a stem slideably mounted inside said steerer tube, headset bearings coaxial with said steerer tube, wherein said stem is rotatable

about the steering axis by manually releasing said stem from said steerer tube such that said handlebar is positioned approximately parallel to the front wheel of the bicycle.

56. A Steering assembly of Claim 55 wherein said stem comprises vertical members with a round cross sectional shape and at least one longitudinal channel cut in said vertical member.

57. A steering assembly of Claim 56 wherein said handlebar assembly has a restraining device which is manually unlocked and a second operation is required to allow said stem to rotate axially about the steering axis for storage.

58. A steering assembly of Claim 57 further comprising a second restraining device and wherein said second operation comprises releasing a second restraining device which restricts the movement of the handlebar to a specific height where the stem can rotate axially about the steering axis.

59. A steering assembly of Claim 57 wherein said second operation comprises releasing a second restraining device which allows the stem to rotate axially about the steering axis at any height said device must be held open.

60. A steering assembly for a bicycle comprising; a front wheel fork having an upwardly extending steerer tube, a handlebar assembly including a stem mounted on the outside of an upper end of said steerer tube and a manually operated restraining device for coupling said stem to said upper end of said steerer tube.

61. A steering assembly of Claim 60 wherein, said stem is configured to rotate about the steering axis to a position approximately parallel to the front wheel of the bicycle for storage after said manually operated restraining device is released.

62. A steering assembly of Claim 61 wherein said stem comprises a vertical stem member and a horizontal stem member, and means by which said vertical stem member is manually fastened to said steerer tube.

63. A steering assembly of Claim 62 further comprising a secondary safety locking device which functions to prevent rotation of said stem about said steerer tube.

64. A steering assembly of Claim 63 wherein said secondary safety locking device locks automatically when said stem rotates to the riding position.

65. A steering assembly of Claim 62 wherein said vertical stem member is slotted for clamping onto said steerer tube.
66. A steering assembly of Claim 62 further comprising means wherein, after said manually operated restraining device is released, said stem is constrained to in a vertical axial manner in order to rotate for storage.
67. A steering assembly of Claim 62 wherein said restraining device comprises a locking collar which manually threads onto the outside of said steerer tube thereby pushing downward on said stem.
68. A steering assembly of Claim 62 wherein said restraining device comprises a locking bolt which manually threads into the inside of said steerer tube and the inside of said steerer tube is partially threaded thereby pushing downward on said stem.
69. A steering assembly of Claim 62 wherein said vertical stem member has a concave or convex upper and lower surfaces which, when said restraining device is locked, push against corresponding surfaces to eliminate small movements of said steering assembly during riding.
70. A steering assembly of Claim 62 further comprising upper and lower headset bearings mounted on said steerer tube and wherein said restraining device is used to apply vertical pressure to said lower headset bearings for adjustment of said headset bearings.
71. A steering assembly of Claim 60 wherein said restraining device applies vertical pressure to restrain said stem from horizontal rotation about the steering axis.
72. A steering assembly of Claim 63 wherein said secondary safety locking device comprises a retractable protrusion and a corresponding notch on an adjacent collar fixed to said steerer tube wherein said stem can rotate when said restraining device is unlocked and said retractable protrusion is retracted.
73. A steering assembly of Claim 63 wherein said secondary safety locking device comprises a spring loaded button mounted on the inside of said steerer tube and protruding through a hole in said steerer tube and through a hole in said stem, said button restraining said steerer tube and said stem from movement relative to one another.

74. A steering assembly of Claim 63 wherein said secondary safety locking device comprises a shaped outer surface of said steerer tube which matches and engages a shaped inner surface of said vertical stem member, whereby said stem is prevented from axial rotation about said steerer tube unless said stem is lifted up such that said shaped surfaces are no longer engaging each other.

75. A steering assembly of Claim 63 wherein said secondary safety locking device comprises a shaped outer surface of a shaped collar mounted on the outside of said steerer tube and located on the inside of said vertical stem member, the outer shaped surface of said shaped collar matches and engages a shaped inner surface of said vertical stem member whereby said stem is constrained from rotating axially about said steerer tube unless said stem is lifted up such that said shaped surfaces are no longer engaging each other.

76. A steering assembly of Claim 61 wherein, when said handlebar is rotated to a position approximately parallel to front wheel, said handlebar can be engaged to the front wheel and used to steer the bicycle for parking or during walking.

77. A steering assembly of Claim 61 further comprising means wherein said handlebar is constrained in its rotation to end at a position approximately parallel to the front wheel.

78. A steering assembly of Claim 73 wherein said vertical stem member has an interior horizontal channel which guides said spring loaded button during rotation for storage such that said handlebar ends up in a position approximately parallel to the front wheel of the bicycle.

79. A steering assembly of Claim 63 wherein said secondary safety locking device must be continually activated in order to allow for rotation of said stem about the steering axis.

80. A steering assembly for a bicycle comprising; a front wheel fork having an upwardly extending steerer tube, a handlebar assembly including a stem slideably mounted inside said steerer tube, headset bearings coaxial with said steerer tube, whereby said handlebar assembly is manually rotatable such that said handlebar is positioned approximately parallel to the front wheel of the bicycle.

81. A steering assembly of Claim 80 further comprising means to constrain said rotation of said handlebar assembly about the bicycle steering axis.

82. A steering assembly of Claim 80 further comprising a secondary safety locking device to prevent undesired rotation of said stem about said steerer tube.
83. A steering assembly of Claim 82 further comprising means wherein said secondary safety locking device locks automatically when said stem rotates to the riding position.
84. A steering assembly of Claim 80 wherein said stem comprises a first stem member and a second stem member whereby said first stem member is able to rotate relative to said second stem member.
85. A steering assembly of Claim 81 further comprising a tool for height adjustment of said stem and said handlebar assembly is rotated for storage using a manually operated restraining device.
86. A steering assembly of Claim 84 wherein said first stem member is a horizontal member equipped with at least one serrated pressure cylinder which is used to rotatably lock said first stem member onto a serrated portion of said second stem member, whereby rotation is accomplished by unlocking a primary locking quick release, and then rotating said quick release such that said serrated pressure cylinders are able to disengage from the serrated portion of the second stem member.
87. A steering assembly of Claim 84 wherein said first stem member is constrained to move in a vertical manner relative to said second stem member in order to allow for rotation.
88. A steering assembly of Claim 87 further comprising a secondary safety locking device having a shaped outer surface of the upper end of said second stem member and a shaped inner surface of said first stem member, whereby the outer shaped surface of said second stem member matches and engages the shaped inner surface of said first stem member and a portion of said stem connecting to said handlebar is not able to rotate axially unless said first locking device is unlocked and said first stem member is lifted up such that said shaped surfaces are no longer engaging each other.
89. A steering assembly of Claim 84 wherein said first stem member and said second stem member are fastened together for riding at a point other than on the steering axis.

90. A steering assembly of Claim 89 wherein said first stem member is constrained from rotation to the riding position without a separate action being taken, at which point said first stem member is locked in the riding position.

91. A steering assembly for a bicycle comprising; a front wheel fork having an upwardly extending steerer tube, a handlebar assembly including a two part stem wherein the first part of said stem is slideably mounted inside said steerer tube and the second part of said stem is located exterior to said steerer tube, wherein said first part of said stem is rotatable relative to said second part of said stem.

92. A steering assembly for a bicycle comprising; a front wheel fork having an upwardly extending steerer tube, a handlebar assembly including a two part stem wherein the first part of said stem is slideably mounted inside said steerer tube and the second part of said stem rotates about said first part of said stem at a point other than on the steering axis of the bicycle.

93. A steering assembly of Claim 92 further comprising means wherein said first part of said stem and said second part of said stem are manually fastened together at the steering axis of the bicycle.

94. A steering assembly of Claim 92 further comprising means wherein said first part of said stem and said second part of said stem are manually fastened together at a point other than on the steering axis of the bicycle.